

METHOD AND APPARATUS FOR SECURING A SPORTS BOARD FIN TO A SPORTS BOARD

BACKGROUND

I. Field of Use

[001] The present invention relates to the field of theft prevention devices. More specifically, the present invention relates to a method and apparatus for securing sports board fins associated with various kinds of sports boards, such as surfboards, wakeboards, and the like, to the sports board.

II. Description of the Related Art

[002] The sport of surfing has gained in popularity in the United States and abroad over the past several years. It is estimated that there are currently 3.5 million people who enjoy surfing in the United States alone. In most cases, surfboards are transported to the ocean on top of a car via roof racks or in the bed of a pickup truck. The typical method of securing surfboards to car top roof racks is by a canvas or rubber straps.

[003] One of the disadvantages of transporting surfboards via motor vehicle is that few vehicles are large enough to transport surfboards inside. Consequently, most people transport surfboards external to their vehicles. There exists removable or permanent roof-top racks for automobiles whereby one or more surfboards can be secured for transport. Individuals owning pickup trucks can simply place their surfboard(s) in the bed of the pickup truck.

[004] One disadvantage of transporting large objects such as surfboards external to a vehicle is that they are highly visible and therefore attract thieves when an owner leaves the surfboard unattended. These large objects are difficult to secure against theft due to their large size and unibody construction. Most roof racks today do not have a way to lock the surfboard securely to the vehicle. In most cases, elastic straps are all that is used to secure the surfboard to the vehicle. These are quickly and easily removed by thieves.

[005] One solution to this problem is disclosed in a pending United States patent application belonging to the inventor of the present patent application, entitled "Method and Apparatus for Securing an Object to a Vehicle". This application describes an adjustable shackle that is secured to a vehicle roof rack, or to the bed of a pickup truck. A sports board is secured to the vehicle by placing the board through

the adjustable shackle and then adjusting the shackle to fit snugly against the sides of the board. The board is prevented from being removed from the adjustable shackle by the contour of the board and by fins, bindings, or other physical constraint, typically attached to the board.

[006] The patent application described above also describes a fin guard used in conjunction with the adjustable shackle. The fin guard is designed to prevent removal of a surfboard fin by covering hardware used to attach the fin and wedging between a surface of the board and an inside portion of the adjustable shackle.

[007] One of the features of the fin guard described in the patent application described above is that the fin guard is most effective when the fin is in close proximity to the adjustable shackle. However, as the length of a surfboard increases, this fin guard becomes less effective because the fins are located further and further away from the adjustable shackle when the sports board is secured in place. In turn, the fin guard of the patent application described above may not be long enough to cover the fin mounting hardware and also to wedge between the board and the adjustable shackle.

[008] Another problem with the fin guard described in the patent application described above is that it may not be able to prevent fin removal of some newer fin designs that have been recently introduced into the marketplace. The newer fin removal systems allow a fin to be removed from a surfboard without any type of locking hardware. These fins can be removed simply by prying them out of the “fin box”, rather than being secured by locking hardware.

[009] What is needed, therefore, is an apparatus to prevent a surfboard fin from being removed from a surfboard, no matter what the board length, and no matter what type of fin mounting arrangement is used. Ideally, the apparatus could be used in conjunction with the adjustable locking mechanism described in the patent application described above.

SUMMARY

[0010] A method and apparatus for securing a sports board fin to a sports board. In one embodiment, an apparatus comprises a fin enclosure for covering a fin and an elongated member, connected to the fin enclosure, sized and shaped to wedge between a surface of the board and a sports board security apparatus.

[0011] In another embodiment, an apparatus for securing a sports board fin to a sports board comprises a housing sized and shaped to cover a fin mounting fastener, a shaft extending perpendicularly from the housing, sized and shaped to extend within a channel located underneath a bottom surface of the sports board, a tab located at a

first end of the shaft, the tab sized and shaped to engage a lip of the channel when the housing is rotating to a first position, and for disengaging the tab from the lip when the housing is rotated to a second position, an extendable deadbolt sized and shaped to extend into the channel and located at an axis perpendicular to a longitudinal axis of the tab, and a locking mechanism, for locking the deadbolt into the channel when the locking mechanism is in a locked position, and for allowing the deadbolt to retract out of the channel when the locking mechanism is in an unlocked position.

[0012] In another embodiment, an apparatus for securing a sports board fin to a sports board comprises a mounting bracket, a mating unit removably connected to the mounting bracket, the mating unit comprising an adjustable shackle, a mating portion fixedly secured to the adjustable shackle, and a first locking mechanism operative to allow adjustment of the shackle in an unlocked position and to prevent adjustment of the shackle in a locked position. The apparatus further comprises means for removably securing the mating portion to the mounting bracket, and a fin guard for preventing a fin located on the sports board from being removed.

[0013] In another embodiment, an apparatus for securing a sports board fin to a sports board comprises a housing sized and shaped to cover a fin mounting fastener, a shaft extending perpendicularly from the housing, sized and shaped to extend within a channel located underneath a bottom surface of the sports board, a tab located at a first end of the shaft, the tab sized and shaped to engage a lip of the channel when the housing is rotated to a first position, and for disengaging the tab from the lip when the housing is rotated to a second position, an extendable deadbolt located at an axis perpendicular to a longitudinal axis of the tab, and a second locking mechanism for locking the deadbolt into the channel when the locking mechanism is in a locked position, and for allowing the deadbolt to retract out of the channel when the locking mechanism is in an unlocked position.

[0014] In yet another embodiment, a method for securing a sports board fin to a sports board comprises installing a sports board security apparatus to a vehicle, securing the sports board to the sports board security apparatus, and securing at least one fin located on the sports board with a fin guard, the fin guard for preventing the at least one fin from being removed from the sports board.

[0015] In yet still another embodiment, an apparatus for securing a sports board fin to a sports board comprises means for covering the sports board fin, and means for securing the means for covering the sports board fin to the sports board.

[0016] In yet still another embodiment, an apparatus for securing a sports board fin to a sports board comprises means for covering a fin mounting fastener, means, extending from the means for covering the fin mounting fastener, for engaging a lip of a channel located underneath a bottom surface of the sports board while the covering

means is in a first position, and means for disengaging the engaging means from the lip when the covering means is in a second position.

[0017] Finally, in another embodiment, an apparatus for securing a sports board fin to a sports board comprises means for securing the sports board to a vehicle, and means for preventing removal of a fin located on the sports board.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The features, advantages, and objects of the present invention will become more apparent from the detailed description as set forth below, when taken in conjunction with the drawings in which like referenced characters identify correspondingly throughout, and wherein:

[0019] FIG. 1 illustrates one embodiment of a security apparatus for securing a sports board to a vehicle;

[0020] FIGs. 2a and 2b illustrate one embodiment of a mounting bracket of the security apparatus in FIG. 1;

[0021] FIG. 3 illustrates one embodiment of a mating unit, suitable for use with the security apparatus of FIG. 1;

[0022] FIG. 4 illustrates an optional cylinder for use with the mounting bracket of FIG. 2 shown in a close-up, cross-sectional view;

[0023] FIG. 5 illustrates the mating unit of FIG. 3 being removably installed onto the mounting bracket of FIG. 2, installed on an inside surface of a pickup truck tailgate;

[0024] FIG. 6 illustrates another embodiment of a security apparatus for securing an object to a vehicle;

[0025] FIG. 7 illustrates a mounting bracket suitable for use with the security apparatus of FIG. 6;

[0026] FIG. 8 illustrates a mating unit suitable for use with the security apparatus of FIG. 6;

[0027] FIG. 9 illustrates the mating unit of FIG. 8 about to be removably installed onto two mounting brackets shown in FIG. 7, installed on a vehicle roof rack;

[0028] FIG. 10 is an isometric illustration of one embodiment of a fin guard for use with the security apparatus of FIG. 1 or FIG. 6, installed onto a surfboard;

[0029] FIG. 11 is an exploded view of the fin guard of FIG. 10;

[0030] FIG. 12 is a side view of the fin guard of FIG. 10;

[0031] FIG. 13 is a bottom planar view of the fin guard of FIG. 10;

[0032] FIG. 14a is a cross-sectional view of a channel located underneath a bottom surface of a sports board;

[0033] FIG. 14b is a cross sectional view of the channel of FIG. 14a, with the fin guard of FIG. 10 installed thereon;

[0034] FIG. 15 illustrates another embodiment of a fin guard in use with a sports board, shown in an isometric view;

[0035] FIG. 16 illustrates a bottom view of the fin guard of FIG. 15;

[0036] FIG. 17 illustrates the fin guard of FIG. 15 installed onto a sports board fin and used in conjunction with a sports board security apparatus of either FIG. 1 or FIG. 6;

[0037] FIGs. 18a and 18b illustrate two views of an optional cushion used in the security apparatus of FIG. 1 or FIG. 6;

[0038] FIGs. 19a and 19b are exploded views of yet another embodiment of a security apparatus for securing a sports board to a vehicle;

[0039] FIG. 20 illustrates a flow diagram illustrating a method for securing a sports board fin to a sports board using the fin guard of FIG. 10; and

[0040] FIG. 21 is a flow diagram illustrating a method for securing a sports fin to a sports board using the fin guard of FIG. 15.

DETAILED DESCRIPTION

[0041] The methods and apparatus for securing a sports board fin to a sports board detailed herein enable one to quickly and easily secure a sports board fin to a sports board, such as a surfboard for use in securing the sports board to a vehicle to prevent theft. However, it should be understood that other types of articles could be secured in the alternative, such as snow skis, water skis, wakeboards, snowboards, etc.

[0042] FIG. 1 illustrates one embodiment of a security apparatus 100 for securing a sports board to a vehicle. Shown is a surfboard 102 lying upside-down in the bed 104 of a typical pick-up truck. The rear portion of the surfboard extends past the tailgate of the pick-up truck with its tip lying on the floor of bed 104. The security apparatus 100 comprises a mounting bracket and mating unit, discussed later herein. The mating unit comprises an adjustable, locking shackle which is designed to fit snugly around the width of the surfboard 102 while in a locked position. The physical properties of the surfboard 102 (i.e., board contour, fin(s)) prevent it from being removed from the adjustable shackle. Other objects are retained within the adjustable shackle by their physical properties, such as board shape, bindings, etc. The mating unit is designed to be easily removed from the mounting bracket when security

apparatus **100** is not in use, so that it does not interfere with other uses of the pick-up truck during normal use.

[0043] FIGs. 2a and 2b illustrate one embodiment of a mounting bracket **200**, shown in two isometric views. The mounting bracket **200** is designed to be fixedly installed onto a vehicle, such as against an inside portion of a tailgate of a pickup truck. Of course, mounting bracket **200** could alternatively be located in other locations on a vehicle, such as the roof of any vehicle, or on any location in a bed **104** of a pickup truck, such as the outer portion of a tailgate, or on an inside or outside portion of bed **104**. As used herein, the term “fixedly” generally means that mounting bracket **200** is not easily be removed.

[0044] Mounting bracket **200** is typically manufactured out of any durable, rigid material, such as any type of metal, wood, plastic, or other suitable material. It may comprise a hollow “box”, having a top surface **206**, a bottom surface **210**, side surfaces **214**, and a rear planar surface **204**. It may also include a front surface **216** for forming a hollow enclosure. A great number of alternative embodiments are possible, including mounting bracket **200** comprising only top surface **206**, bottom surface **210**, and rear planar surface **204**. In another alternative embodiment, mounting bracket **200** comprises a solid block of material. In yet another alternative embodiment, mounting bracket **200** comprises only rear planar surface **204** and top surface **206**. Mounting bracket **200** is also not restricted to a rectangular shape. As such, mounting bracket **200** may comprise a square, rectangle, triangle, circle, or other shape when viewed in a planar manner.

[0045] In the example of FIG. 1, mounting bracket **200** is fixedly attached to an inside portion of a pickup truck tailgate using one or more fastening devices, such as screws, bolts, rivets, or other known fastening devices, through mounting holes **202** located on a rear planar surface **204** and/or on front surface **216**. Of course, mounting bracket **200** could be fixedly attached to a surface by using mounting brackets, or even by welding. The only limitation regarding the way in which mounting bracket **200** is fixedly attached to a surface is that it is not easily removable after installation.

[0046] In one embodiment, mounting bracket **200** comprises a top surface **206**, having an aperture **208** located thereon, and a bottom surface **210**, having, in this embodiment, three slots **212**. Aperture **208** is designed to receive a rigid element, such as a pin, bolt, shackle, or other element which removably secures a mating unit, described later herein, to mounting bracket **200**. The slots **212** are each designed to receive a tab from the mating unit. The combination of these two features allow the mating unit to be removably secured to mounting bracket **200**. The term “removably”, as used herein, generally means that the mating unit is able to be quickly and easily installed and removed from mounting bracket **200**.

[0047] FIG. 3 illustrates one embodiment of a mating unit 300 and a retaining pin 322 of the security apparatus of FIG. 1. In this embodiment, mating unit 300 comprises a mating portion 302, an adjustable shackle 304, and a locking mechanism 306. Mating unit 300 is also preferably constructed of a rigid material such as metal, wood, plastic, rubber, or a combination of materials, strong enough to prevent a thief from destroying mating unit 300 during an attempted theft. A fixed portion 314 of adjustable shackle 304 is fixedly connected to a top surface 308 of mating portion 302, typically by welding or other suitable method known in the art. An adjustable portion 316 of adjustable shackle 304 inserts into fixed portion 314, thereby forming an adjustable opening through which surfboard 102, or other object, may be placed.

[0048] Both adjustable portion 316 and fixed portion 314 are preferably formed of a material not easily cut through with a hacksaw, for instance. The outer surface of each portion may additionally be covered with a hard plastic, rubber, or other material to add difficulty to anyone attempting to cut through either portion. Alternatively, or in addition to the hard material, padding may be deposited on fixed portion 314 and a portion of adjustable portion 316 so that minimal damage that might otherwise occur to an object that is secured by adjustable shackle 304.

[0049] Locking mechanism 306 comprises a combination or key-operated lock, similar to many adjustable locking devices in common use today. Examples of manufacturers offering such a locking mechanism include ABA locks and Royal Lock Corporation of Wauconda, Illinois. Locking mechanism 306 typically comprises a spring-loaded deadbolt which engages a series of notches 318 located on adjustable portion 316. In an unlocked position, the deadbolt is pushed into a shank portion of locking mechanism 306 as each of notches 318 pass the deadbolt, thereby allowing free movement of adjustable portion 316 within fixed portion 314 and, thus, allowing an opening formed by adjustable shackle 304 to vary. In a locked position, the deadbolt is prevented from being pushed out of notches 318, thereby preventing the opening formed by adjustable shackle 304 from varying.

[0050] Mating portion 302 comprises a top surface 308, having an aperture 310 located thereon, a lower portion 312, and a plate 320 connecting top surface 308 and lower portion 312. Aperture 310 aligns with aperture 208 during assembly of mounting bracket 200 and mating unit 300, whereby retaining pin 322 is inserted through the apertures, removably securing mating unit 300 to mounting bracket 200. Retaining pin 322 comprises a pin, dowel, plug, shackle, wedge, or the like, that, when inserted through apertures 208 and 310 (and in combination with lower portion 312 and slots 212), prevents mating unit 300 from being removed from mounting bracket 200 and, hence, the vehicle. As just mentioned, in one embodiment, lower portion 312 comprises three "tabs" for insertion through slots 212 of mounting

bracket 200. In other embodiments, there may be fewer or a greater number of tabs, the tabs could comprise pins, or any other extrusion, to fit within a corresponding slot, or other opening, on lower surface 210. In the embodiment of FIG. 3, the center tab comprises an aperture 324 which aligns with aperture 208 and receives retaining pin 322 during assembly of mounting bracket 200 and mating unit 300. In yet another embodiment, lower portion 312 could comprise a rectangular flange having no tabs, pins, or other extrusions, but comprises an aperture which aligns with an aperture located on lower surface 210 during assembly of mounting bracket 200 and mating unit 300. Retaining pin 322, having sufficient length, could then be inserted through both sets of apertures (i.e., aperture 208 and aperture 310, and the apertures located on lower portion 312 and lower surface 210), securing the two units together.

[0051] A key feature of the embodiments presented herein is that mating unit 300 is removably secured to mounting bracket 200 without the use of a locking mechanism. This allows quick installation and removal of the mating unit. In addition, a second key or combination is not needed (in addition to a key or combination for use with locking mechanism 306) to secure mating unit 300 to mounting bracket 200. The retaining pin 322 is prevented from being removed when a surfboard or similar object is secured through adjustable shackle 304 because the surfboard surface lays on top of retaining pin 322.

[0052] FIG. 4 illustrates an optional cylinder 400 for use with the mounting bracket of FIG. 2, shown in a close-up, cross-sectional view. The cylinder 400 prevents retaining pin 322 from being moved laterally from an alignment with aperture 208. This prevents a potential thief from attempting to remove retaining pin 322 by wiggling the pin and removing it in spite of surfboard 102 covering the pin. The cylinder 400 is typically welded to an undersurface of top surface 206 having a diameter sufficiently large enough to allow retaining pin 322 to be inserted therein.

[0053] FIG. 5 illustrates the mating unit 300 of FIG. 3 being removably installed onto the mounting bracket 200 of FIG. 2, installed on an inside surface of a pickup truck tailgate, shown from a side view. Mounting bracket 200 is fixedly secured to the tailgate using the methods described above. Lower portion 312, comprising three tabs in this example, is inserted into slots 212, then mating unit 300 is pivoted so that top surface 308 of mating unit 300 covers top surface 206 of mounting bracket 200. Retaining pin 322 is then inserted through aperture 310 of mating unit 300, aperture 208 of mounting bracket 200, and optionally, an aperture located on lower portion 312 of mating unit 300. This design allows for fast installation and uninstallation of the mating unit 300, which is a major advantage over other security mechanisms.

[0054] FIG. 6 illustrates another embodiment of a security apparatus 600 for securing an object to a vehicle. Shown is surfboard 602 secured to a vehicle roof rack

604. The security apparatus **600** comprises a set of mounting brackets fixedly secured to roof rack **604** and a mating unit, discussed later herein. Similar to security apparatus **100** of FIG. 1, the mating unit comprises an adjustable, locking shackle, and is designed to be easily removed from the mounting brackets when security apparatus **600** is not in use. Objects such as surfboards, skis, wakeboards, and snowboards are retained within the adjustable shackle by their respective physical properties such as board contour, fin(s), bindings, etc.

[0055] FIG. 7 illustrates a mounting bracket suitable for use with the security apparatus of FIG. 6, shown as mounting bracket **700**. Mounting bracket **700** is designed to be fixedly installed onto a vehicle roof rack, and comprises U-shaped bracket **702** and receiving block **704**. U-shaped bracket **702** and receiving block **704** are fixedly secured to a vehicle roof rack by placing these elements around such a rack, through an opening formed by the joinder of bracket **702** and block **704**. They are secured around the roof rack using fastening means (not shown) such as screws, rivets, bolts, or any other suitable means known in the art, through holes **706** and receptacles **708**. Of course, these elements may be secured by other means, such as by welding.

[0056] U-shaped bracket **702** comprises a top portion **714**, a bottom portion **716**, both joined by a rear portion **718**. In this embodiment, top portion **714** and bottom portion **716** each comprise a channel **720** running the entire width of each portion, and rear portion **718** comprises a riser **722**. These features are optional in the design of mounting bracket **700**. The riser **722** is used as a surface against which a mating unit (described below) rests upon assembly.

[0057] U-shaped bracket **702** additionally comprises four through holes **706**. These holes allow mating hardware, such as screws, rivets, bolts, etc. to be inserted therethrough to engage receptacles **708**, such as threaded holes or inserts, in receiving block **704**.

[0058] Receiving block **704** comprises aperture **712**, which is a hole that extends at least a portion through the height of receiving block **704**. Aperture **712** is designed to align with two apertures located on a mating unit as the mating unit is installed onto each mounting bracket **700**.

[0059] Typically, two mounting brackets **700** are used on a single roof rack for securing an object, while a second roof rack may comprise ordinary means for securing the object during transport. The two mounting brackets **700** are generally spaced apart from one another, approximately twelve inches in one embodiment. In one embodiment, receiving block **704** comprises an alignment hole **724** located on one side of receiving block **704**. The alignment hole **724** is designed to receive an alignment rod (not shown) for insertion therein and to a similar hole located on a side

of another mounting bracket **700**. The alignment rod allows the two mounting brackets **700** to maintain a fixed relationship with each other, which may be important, depending on the shape and curvature of the roof rack to which they are secured.

[0060] It should be understood that mounting bracket **700** could comprise numerous alternative features and should not be limited to only the embodiment shown in FIG. 7. In one alternative embodiment, the bracket **702** and block **704** are formed of two sections that surround a roof rack from the bottom and the top, rather than surrounding the roof rack from the sides, as shown in FIG. 7. In other examples, fewer or a greater number of through holes **706** could be used, the through holes **706** could be threaded, aperture **712** could be located through top portion **714**, bottom portion **716**, and rear portion **718** either alternatively, or in addition to the aperture **712** located on receiving block **704**, the alignment hole **724** could be of any cross-sectional shape, including a rectangle, triangle, ellipse, etc.

[0061] As mentioned previously, mounting bracket **700** is installed around a roof rack, typically mounted to a roof of a vehicle. However, most roof racks in use do not have a cross section conforming to the opening formed by the joinder of bracket **702** and block **704**. Typically, a roof rack cross-section comprises a “wing” cross-section, being flat on a bottom surface and rounded on a top surface. In this case, mounting bracket **700** may not fit well over the roof rack, and allow the mounting bracket **700** to pitch to and fro or allow the mounting bracket **700** to slide out of position on the roof rack. To alleviate this problem, a pair of inserts may be positioned inside the opening of mounting bracket **700**, having an outer surface that conforms to the surface of the mounting bracket opening, and an inner surface that conforms to the roof rack surface. Details of this type of insert can be found on FIGs. 13a and 13b, along with accompanying text.

[0062] FIG. 8 illustrates a mating unit **800** suitable for use with the security apparatus of FIG. 6 and retaining pins **808**. Mating unit **800** comprises a mating portion **802**, an adjustable shackle **804**, and a locking mechanism **806**. The structures of mating unit **800** are much the same as mating unit **300**, with the exception of mating portion **802**. In this embodiment, mating portion **802** comprises an “U” shaped extrusion, having adjustable shackle affixed thereto. The extrusion is designed to slide over a pair of mounting brackets **700** fixedly secured to a vehicle roof rack. The extrusion is removably secured to the mounting brackets by inserting two retaining pins **808** through apertures **810** located on each end of mating portion **802** and through aperture **712** located on each of the mounting brackets. Once an object such as a surfboard is secured in place by adjustable shackle **804**, the retaining

pins **808** are not easily removed, because the surface of the object interferes with removal of the retaining pins **808**.

[0063] FIG. 9 illustrates the mating unit **800** of FIG. 8 about to be removably installed onto two mounting brackets **700** of FIG. 7, installed on a vehicle roof rack. Shown is optional alignment rod **900** connecting the two mating units.

[0064] FIG. 10 illustrates fin guard **1000** generally for use with the security apparatus of FIG. 1 or FIG. 6, shown installed onto a surfboard. Fin guard **1000** may be used in situations where the fins of a surfboard are removable. Such removable fins have become popular in recent years, because they allow for easier transportation and storage of surf boards, and allow inexpensive replacement if a fin should become damaged. However, removing one or more fins from a surfboard **602** secured by security apparatus **100** or **600** might allow a thief to slide the surfboard out from the adjustable shackle. Fins using this type of design are generally removable by accessing a fin mounting fastener (not shown), generally installed directly behind fin **1006** and into a channel **1008** located underneath a bottom surface of the surfboard.

[0065] In one embodiment, fin guard **1000** comprises a housing **1002** and a locking mechanism **1004**. Fin guard **1000** mounts to the surface of surfboard **106** over channel **1008** generally behind fin **1006** and covers a fin mounting fastener, such as a screw, bolt, rivet, clip, or other fastening device, generally located within channel **1008**. Housing **1002** thus prevents access to the fin mounting fastener, thereby preventing removal of the fin. Fin guard **1000** is held in place over channel **1008** by a combination of a shaft/tab arrangement and a retractable deadbolt (not shown), both described in detail below. Fin guard **1000** is typically constructed of a rigid material such metal or other material difficult for a thief to destroy. It should be understood that fin guard **1000** may comprise virtually any shape when viewed from a top view, including square, rectangular, oval, or triangular shapes, among others.

[0066] FIG. 11 illustrates the fin guard **1000** of FIG. 10 in an exploded view. Shown are housing **1002**, locking mechanism **1004**, retractable deadbolt **1100**, shaft **1102**, tab **1104**, tab mounting hole **1106**, locking mechanism mounting hole **1108**, locking mechanism retaining hardware **1110**, retaining hardware hole **1112**, and keyed portion **1114**.

[0067] Locking mechanism **1004** and retractable deadbolt **1100** are generally purchased as a single unit. Locking mechanism **1004** is fixedly installed into locking mechanism hole **1008**, secured by, for example, retaining hardware **1110**, which may comprise any known fastening devices, such as a nut and bolt combination, a pin and receptacle combination, etc.

[0068] In an unlocked position, a keyed portion **1114** of locking mechanism **1004** is raised a certain distance above a top surface of housing **1002**, while the retractable

deadbolt **1100** is retracted within housing **1002**. In a locked position, keyed portion **1114** is pushed down into housing **1002**, forcing deadbolt **1100** to extend from a bottom surface of housing **1002**. A key is then used to lock deadbolt **1100** into the extended position. Generally, keyed portion **1114** remains within housing **1002** in the locked position and is spring-loaded such that it extends into the raised position upon being unlocked. It should be understood that although locking mechanism **1004** is shown as a keyed locking mechanism, other types of locking mechanisms could be used in the alternative, such as a combination locking mechanism.

[0069] Shaft **1102** is, in one embodiment, fixedly attached to a bottom surface of housing **1002**. A pin or tab **1104** is inserted through a tab mounting hole **1106** in one end of shaft **1102**. In one embodiment, tab **1104** is inserted such that only one end of tab **1104** protrudes from tab mounting hole **1106**, while in another embodiment, tab **1104** is inserted such that two ends protrude from tab mounting hole **1106**. Thus, tab **1104** is in a fixed relationship with shaft **1102** and, therefore, housing **1002**. Therefore, if housing **1002** is rotated around a longitudinal axis, tab **1104** will likewise rotate in relation to housing **1002**.

[0070] FIG. 12 illustrates fin guard **1000**, shown in a side view, having housing **1002**, locking mechanism **1004**, shaft **1102**, tab **1104**, deadbolt **1100**, and lower surface **1200**. Deadbolt **1100** is shown in an extended position, with locking mechanism **1004** in a locked position. When locking mechanism **1004** is in an unlocked position, deadbolt **1100** retracts into housing **1002**. It should be understood that although this embodiment of fin guard **1000** comprises deadbolt **1100** being retractable and shaft **1102**/tab **1004** being fixed with respect to housing **1002**, fin guard **1000** could alternatively comprise a shaft/tab combination that is rotatable with respect to housing **1002** by using locking mechanism **1004**, while deadbolt **1100** is fixed in an extended position as shown in FIG. 12. In this embodiment, housing **1002** is placed over channel **1008** with tab **1004** oriented parallel to channel **1008** and deadbolt **1100** aligned with channel **1008**, allowing both deadbolt **1100** and tab **1004** to be inserted within channel **1008**, bringing housing **1002** flush against channel **1008**. Then, locking mechanism is placed in a locked position, whereby shaft **1102** and tab **1004** are rotated such that tab **1004** becomes perpendicular to channel **1008**, lodging tab **1004** underneath a lip of channel **1008** (illustrated as lip **1400** in FIG. 14a). In this position, housing **1002** is prevented from being removed from channel **1008** by tab **1004** engaged with the lip of channel **1008**, while housing **1002** is prevented from being rotated by deadbolt **1100**.

[0071] FIG. 13 illustrates a bottom planar view of fin guard **1000** of FIG. 10. In this illustration, tab **1104** extends from both sides of shaft **1102** along a longitudinal axis **1300**. Deadbolt **1100** is located along an axis **1302** perpendicular to longitudinal

axis **1300**. The alignment between deadbolt **1100** and tab **1104** is such that both features extend into a channel (shown as dashed lines **1008**) located on a bottom surface of a sports board installation, with tab **1104** locking within channel **1008** and deadbolt **1100** extending into channel **1008** preventing rotation of housing **1002** and, thus, tab **1104**.

[0072] Installation of fin guard **1000** onto surfboard **106** is accomplished by, first, having deadbolt **1100** retracted, i.e., locking mechanism **1004** in an unlocked position. Housing **1002** is rotated such that tab **1104** is parallel to channel **1008**. The housing is then placed flush against the bottom surface of surfboard **106**, generally just behind fin **1006**, allowing shaft **1102** and tab **1104** to extend into channel **1008**. An optional race **1304** allows a fin mounting fastener, located on the bottom surface of surfboard **106**, to be inserted into race **1304** at this point, thereby allowing housing **1002** to lie smoothly against the bottom surface of surfboard **106**. Although shown as completely circumnavigating the circumference of housing **1002**, race **1304** may, in other embodiments, comprise a hole or other depression that does not completely circumnavigate the circumference of housing **1002**.

[0073] With housing **1002** resting flush against the bottom surface of surfboard **106**, housing **1002** is then rotated such that tab **1104** is perpendicular to channel **1008** and engaging a lip **1200** within channel **1008** (shown in cross section in FIG. 14a). In this position, deadbolt **1100** is also aligned with channel **1008**. Next, deadbolt **1100** is inserted into channel **1008**, and is locked in place by placing locking mechanism **1004** in a locked position. With deadbolt **1100** inserted into channel **1008**, housing **1002**, and therefore tab **1104**, cannot rotate, thereby preventing removal of fin guard **1000** and, thus, fin **1006**. The final installation is shown in cross section in FIG. 14b. Removal of fin guard **1000** involves unlocking locking mechanism **1004** such that deadbolt **1100** retracts from channel **1008** and into housing **1002**. Housing **1002** is then rotated approximately 90 degrees, thus disengaging tab **1104** from lip **1200**. Housing **1002** is then free to be removed from the surface of the surfboard.

[0074] FIG. 15 is an isometric view of another embodiment of a fin guard, shown as fin guard **1500**. Fin guard **1500** is designed to cover a sports board fin to prevent the fin from being removed from a sports board. Fin guard **1500** is especially useful on fins that are removable without using any type of fin locking fasteners. Such fins are removed generally by simply prying the fin out of a channel located beneath the bottom surface of the sports board.

[0075] Fin guard **1500** comprises a fin enclosure **1502** and an elongated member **1504**, which is sized and shaped to wedge between an inner portion of the locking apparatus of FIG. 1 or FIG. 6 and the bottom surface of surfboard **106**, thereby preventing fin guard **1500**, and thus a surfboard fin, from being removed from

surfboard 106. Fin enclosure 1502 is sized and shaped to accommodate various sizes of fins and is approximately one inch wide, in one embodiment. Fin enclosure 1502 is generally hollow, allowing fins to be completely enclosed by fin enclosure 1502.

[0076] Fin guard 1500 further comprises base 1506 to which elongated member 1504 and fin enclosure 1502 are mounted. Base 1506 may comprise raised edges 1508, which allows fin guard 1500 to rest flush against the bottom surface of surfboard 106, allowing for any fin mounting hardware to reside within a cavity formed by base 1506 and the bottom surface of surfboard 106. Base 1506 comprises a slotted opening 1510, allowing a fin to enter fin enclosure 1502.

[0077] Elongated member 1504, fin enclosure 1502, and base 1506 may be constructed of any rigid material such as plastic, metal, fiberglass, resins, etc. In one embodiment, elongated member 1504 and fin enclosure 1502 are constructed as a single unit, although that need not be the case. Further, elongated member 1504 and fin enclosure 1502 may be constructed by molding two half sections and joining the two halves together using glue, resin, epoxy, welding, or by other means known in the art. Base 1506 may likewise be manufactured from any suitable rigid material, and joined with elongated member 1504 and fin enclosure 1502 using the techniques just described.

[0078] Fig. 16 illustrates a bottom planar view of fin guard 1500. Shown is base 1506, and optional adjuster plate 1600. Adjuster plate 1600 is used to vary the length of slot opening 1510 to accommodate different sized fins. The thickness of adjuster plate 1600 is generally less than the height of raised edges 1508 so that adjuster plate 1600 fits within a cavity formed by base 1506 and the bottom surface of surfboard 106. Adjuster plate 1600 is mounted to base 1506 and comprises adjusting slot 1602, mounting slots 1604, and fasteners 1606. Adjusting slot 1602 is generally equal in length to slot opening 1510 and resides situated over slot opening 1510. The width of adjusting slot 1602 may be slightly larger than, equal to, or slightly smaller than slot opening 1510. The resultant slot, formed from the overlap of slot opening 1510 and adjusting slot 1602, can be varied in length depending on the location of adjusting slot 1602. This enables fins of various sizes to be accepted by fin enclosure 1502. The size of the resultant slot is varied by sliding adjuster plate 1600 fore and aft and is then secured in place using fasteners 1606, which may comprise screws, bolts, or other fastening means. It should be understood that adjuster plate 1600 could also be used to vary the position of adjusting slot 1602, rather than the size of a resultant slot, if slot opening 1510 is not used. In other words, if fin enclosure 1502/base 1506 does not comprise slotted opening 1510 and simply comprises open space leading into fin enclosure 1502, then adjuster plate 1600 can be used to position adjusting slot 1602 fore and aft, to accommodate various fin positions.

[0079] FIG. 17 is an isometric view of fin guard **1500** installed over a surfboard fin and used in conjunction with the security apparatus **100** of FIG. 1 or **600** of FIG. 6. Fin enclosure **1502** is shown covering a fin of surfboard **106**, while elongated member **1504** is shown wedged between a bottom surface of surfboard **106** (along with base **1506**) and an inner surface of adjustable shackle **304** of the security apparatus of FIG. 1 or FIG. 6. It should be understood that elongated member **1504** may be directly in contact with the bottom surface of a sports board (in the case where base **1506** is absent, or if base **1506** only extends the length of fin enclosure **1502**) or sandwiched between base **1506** and the security apparatus of FIG. 1 or FIG. 6, with base **1506** in contact with the bottom surface of surfboard **106**. Fin guard **1500** cannot be removed from the fin, because of the wedging effect of elongated member **1504**. Surfboard **106** cannot move in an aft direction because of the contour of surfboard **106** against the security apparatus of FIG. 1 or FIG. 6.

[0080] FIGs. 18a and 18b illustrate two views of an optional cushion **1800** used in the security apparatus of FIG. 1 or FIG. 6. Cushion **1800** is typically used in pairs, each cushion secured to a curved portion of adjustable shackle **304** or **804**, as the case may be. Although not essential to the embodiments described herein, the optional cushions allow a surfboard **102** to be secured within an opening formed by adjustable shackle **304** or **804** without damaging the rails of surfboard **102**. Additionally, the cushions **1800** allow a top and bottom surfaces of surfboard **102** to avoid contact with an inside surface of adjustable shackle **304** or **804**, thereby avoiding damage to those surfaces.

[0081] Cushion **1800** comprises a contact surface **1802** which is designed to conform to a surfboard rail cross-section. Contact surface **1802** comprises a material which is semi-rigid, allowing the contact surface **1802** to flex and fit snugly against a surfboard rail. The material comprises a smooth surface so that the surfboard rails are not scratched or otherwise damaged by the cushion. Examples of such materials include plastic, rubber, polyurethane, or other suitable material. Cushion **1800** typically comprises filler **1804** for helping maintain the overall shape of the cushion. Filler **1804** may comprise varying degrees of elasticity, ranging from soft to hard. In one embodiment, filler **1804** comprises foam rubber, but in other embodiments, could comprise plastic, epoxy, resin, rubber, wood, etc. In yet another embodiment, no filler is used.

[0082] It should also be understood that cushion **1800** could alternatively comprise a malleable object, such as a balloon filled with gel, air, or some other material. In such an embodiment, cushion **1800** would conform to a surfboard rail cross-section upon impact with the surfboard.

[0083] Cushion **1800** typically comprises one or more means for securing the cushion to adjustable shackle **304** or **804**. As illustrated in FIG. 18, fastening means **1806** comprises a pin which comprises a flared end that is inserted through a hole located on a curved portion inner surface of adjustable shackle **304** or **804**. The length of the pin is such that it will not allow cushion **1800** to be rotated or displaced laterally, disengaging the pin from the hole in the curved portion, thereby providing additional clearance that could allow the surfboard to be removed. Cushion **1800** additionally comprises retainers **1208** for wrapping around a portion of adjustable shackle **304** or **804**, thereby additionally securing cushion **1800** in place. The retainers **1808** may comprise any material for wrapping around a portion of adjustable shackle **304** or **804** including string, tie-wraps, leather straps, or, in the embodiment shown in FIG. 18, Velcro straps. The retainers **1808** are secured to a rear portion of cushion **1800** by any suitable means, such as a pin, rivet, or other means.

[0084] FIGs. 19a and 19b are exploded views of yet another embodiment of a security apparatus **1900** for securing an object to a vehicle. Cushions **1800** are installed as illustrated. The security apparatus of this embodiment comprises mating unit **1902** and mounting bracket **1904**. The mating unit **1902** is quite similar to mating unit **300** of FIG. 3 with the exception of mating portion **1906**. Mating portion **1906** comprises an L-shaped extrusion which slides over mounting bracket **1904** upon installation. Mating portion **1906** comprises a bottom lip **1908** which prevents mating unit **1902** from being removed from mounting bracket **1904** after mating unit **1902** is removably secured to mounting bracket **1904**.

[0085] Mounting bracket **1904** comprises extrusion **1910**, lower bracket **1912**, upper insert **1914**, and lower insert **1916**. A vehicle roof rack is sandwiched between upper insert **1914** and lower insert **1916**, then the inserts are secured within extrusion **1910** using lower bracket **1912**.

[0086] FIG. 19b shows a more detailed view of extrusion **1910**, lower bracket **1912**, upper insert **1914**, and lower insert **1916**. Lower insert **1916** is held within lower bracket **1912** and upper insert **1914** held within extrusion **1910** by one or more fastening means **1938**. Fastening means **1938** comprises four retaining pins which fit into receiving holes **1940** located on extrusion **1910**, lower bracket **1912**, upper insert **1914**, and lower insert **1916**, as shown. Of course, a greater or fewer number of fastening means could be used in the alternative, or other means could be used, either alternatively or in addition to, to fasten the inserts to extrusion **1910** and lower bracket **1912**. When the components of FIG. 19b are assembled, the inserts form an opening which conforms to the shape of a vehicle roof rack. The inner surface of the inserts may be shaped to conform with the different roof rack shapes available on the market from vehicle manufacturers or after-market suppliers.

[0087] The lower bracket 1912 is fixedly secured to extrusion 1910 using any known fastening means, such as screws, rivets, bolts, etc. through holes 1918 and 1920. Four pairs of such holes are shown in the embodiment of FIG. 19b but a fewer or greater number of holes could be used in the alternative. The lower bracket 1912 may be secured to extrusion 1910 by other means, such as welding, either in addition or alternatively to the screws, rivets, or bolts. The mounting bracket 1904, therefore, is generally fixedly secured to a vehicle roof rack, and remains in place whether or not mating unit 1902 is attached. The inserts are held securely in place by the clamping force of the securing means.

[0088] Lower bracket 1912 comprises apertures 1942 which align with apertures 1946 on extrusion 1910 when assembly is complete. These apertures allow a retaining pin 1944 to be inserted therethrough. The apertures 1942 may comprise through holes or they may only extend a portion through lower bracket 1912.

[0089] During assembly of mating unit 1902 to mounting bracket 1904, the mating unit 1902 slides onto mounting bracket 1904, with an upper surface 1922 covering an upper surface 1930 of extrusion 1910. Bottom lip 1908 covers a portion of a lower surface 1924 of extrusion 1910. One or more apertures 1926 located on upper surface 1922 align with one or more apertures 1946 located on upper surface 1930 of extrusion 1910. A retaining pin 1944 similar to retaining pin 322 is then inserted through apertures 1926, 1946, and 1942, thereby removably securing mating unit 1902 to mounting bracket 1904. Like previous embodiments, the retaining pin is not removable when an object is secured through the adjustable shackle.

[0090] FIG. 20 is a flow diagram illustrating a method for securing a fin to a sports board using fin guard 1000. In step 2000, locking mechanism 1004 is placed in an unlocked position, thereby retracting deadbolt 1100 into housing 1002. In step 2002, housing 1004 is rotated such that tab 1104 is parallel to a channel located underneath a bottom surface of a sports board. The channel is used to secure a fin of the sports board in place, generally using a fastening means of some sort.

[0091] In step 2004, shaft 1102/tab 1004 is/are inserted into the channel until a bottom surface of housing 1002 is in contact with the bottom surface of the sports board. At this point, tab 1004 extends below a lip 1400 of the channel.

[0092] In step 2006, housing 1002 is rotated approximately 90 degrees, positioning tab 1004 perpendicular to the channel. Tab 1004 is now lodged beneath lip 1400, thereby preventing housing 1002 from being removed from the bottom surface of the surfboard.

[0093] In step 2008, locking mechanism 1004 is placed in a locked position, thereby causing deadbolt 1100 to extend from housing 1002 into the channel. Once deadbolt 1100 has been inserted into the channel, housing 1002 cannot be rotated,

thereby preventing tab **1004** from being disengaged from lip **1400**. The fin cannot be removed because housing **1002** covers the fin fastening means.

[0094] FIG. 21 is a flow diagram illustrating a method for securing a fin to a sports board using fin guard **1500**. In step **2100**, an adjuster plate **1600** is moved to accommodate a certain fin size that is to be encapsulated by fin guard **1500**. The adjuster plate is secured using fastening means **1606**. Next, in step **2102**, fin guard **1500** is placed over a fin of a sports board, the fin being enclosed by fin enclosure **1502**. The base **1506** rests against a bottom surface of the sports board.

[0095] In step **2104**, the sports board is positioned within, for example, security apparatus **100** of FIG. 1. The board is placed within adjustable shackle **304**, with elongated member **1504** wedging between security apparatus **100** and the bottom surface of the sports board (and/or base **1506**). In step **2106**, adjustable shackle **304** is tightened around the sports board and locked in place. Fin guard **1500** is prevented from being removed from the sports board because of the physical relationship between security apparatus **100** and base **1506** in contact with the bottom of the sports board.

[0096] The previous description of the preferred embodiments is provided to enable any person skilled in the art to make and use the present invention. The various modifications to these embodiments will be readily apparent to those skilled in the art, and the generic principles defined herein may be applied to other embodiments without the use of the inventive faculty. Thus, the present invention is not intended to be limited to the embodiments discussed herein, but is to be accorded the widest scope consistent with the principles and novel features disclosed herein.

[0097] I CLAIM: